

**A SWITCHED-CAPACITOR CONTROLLER TO CONTROL THE RISE
TIMES OF ON-CHIP GENERATED HIGH VOLTAGES**

5 **ABSTRACT OF THE DISCLOSURE**

10 A switched capacitor controller accurately controls the rise time of
an on-chip generated high voltage. An on-chip charge pump is used to
generate a high voltage (VPP) from an external power supply voltage
(VCC). This high voltage signal (VPP) can be used to program Flash
memory cells. A capacitor of a switched capacitor circuit is selectively
switched between ground and a given node voltage. This generates a stair-
stepped ramp function. The period of the steps is controlled according to a
clock signal. This clock signal may be altered to produce the desired
15 period. The voltage increases of the steps is regulated by a reference
voltage multiplied by a ratio between two capacitor values. Thereby, the
rise-time of the ramp function is accurately controlled as a function of the
frequency of the clock signal and the ratio of the two capacitor values.